

# JUNIOR HIGH

## COMPUTER LITERACY



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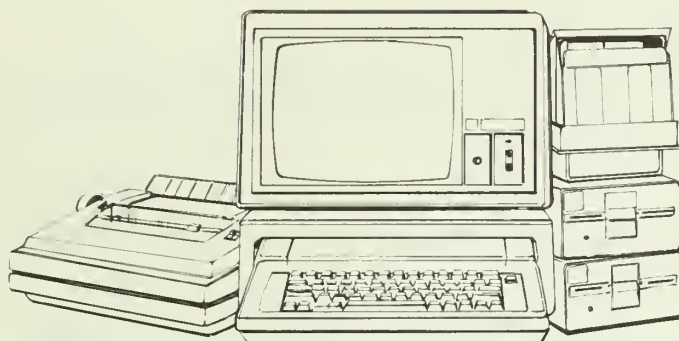
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# **JUNIOR HIGH COMPUTER LITERACY**

**CURRICULUM GUIDE**  
**SEPTEMBER 1984**

# ACKNOWLEDGEMENTS

Alberta Education wishes to acknowledge and extend its appreciation to the following for their contribution to the development of the junior high computer literacy program.

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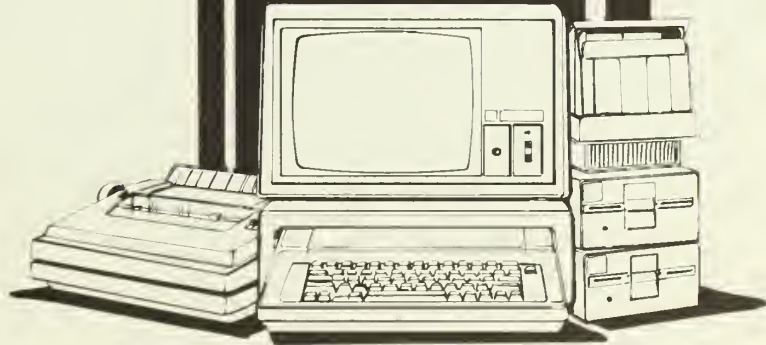
NOTE: This publication is a service document. The advice and direction offered is suggestive except where it duplicates or paraphrases the contents of the Program of Studies. In these instances, the content is in the same distinctive manner as this notice so that the reader may readily identify all prescriptive statements or segments of the document.

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# THE COMPUTER LITERACY PROGRAM







# THE COMPUTER LITERACY PROGRAM

## Introduction

The computer literacy program was developed in response to needs expressed by educators in the field and the resolutions passed by the Curriculum Policies Board at its meeting in November, 1980. In March, 1981, a committee was convened to compile a number of recommendations pertaining to the introduction of computer literacy in the Alberta curriculum. These recommendations reflected the view of school system representatives, the chairpersons of various subject area curriculum coordinating committees, and representatives of Alberta Education and ACCESS. The program is also in response to the recommendations contained in the report of the Minister's Task Force on Computers in Schools, released in June, 1983.

The junior high computer literacy program is a basic introductory program developed in response to the need to acquaint junior high school students with a general understanding of computers and their use. The program has been developed in keeping with the elementary computer literacy program introduced in 1983 and the courses offered at the high school level (Computer Literacy 10, Computer Processing 10-20-30). An effort has been made to coordinate and minimize content overlap with these programs and to accommodate students with or without previous computer experience.

# Rationale and Philosophy

For thirty years there has been a steady improvement in the performance of digital electronic components and a corresponding growth in the power of computer systems. The development and widespread use of large-scale integrated circuits that can be mass produced for a few cents has made it possible to build computers and other microelectronic systems in large numbers at low enough costs to open a mass market. The cost-effectiveness of computing has increased more than a million times in the period following World War II.

During the next few years, microelectronic intelligence is likely to be incorporated into a large number of household and industrial products. Many of these products will become linked together by a worldwide communications system into a vast network that will dominate our lives and fundamentally change the world in which we live. Humankind is witnessing the transformation of the industrial society based upon energy into the electronic society based upon information.

This transformation is creating the greatest occupational upheaval in history. Many people will emerge from this upheaval permanently unemployable. At the same time, there will be a critical shortage of advanced skills, most of them associated with microprocessors and their applications. There will be a need for the entire population to be computer literate, and unless such literacy is imparted from early childhood, a substantial part of the population may find that they lack the basic skills needed to get along in their daily lives.

As the specific skills, knowledge and attitudes required to be computer literate will vary with time and with the students' level of computer expertise, the definition of computer literacy should remain flexible and dynamic. The following functional definition presents the elements that form the basis for the provincial computer literacy program:

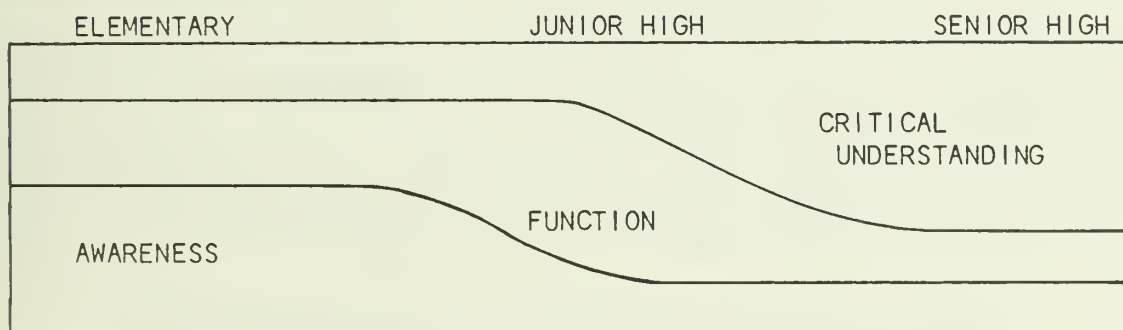
*To be computer literate one must be able to describe, demonstrate and/or discuss (critically) how computers are used; how computers do their work; how computers are programmed; how to use a computer and how computers affect our society.*

The computer literacy program is based upon the following philosophical assumptions:

- as computer literacy is an aspect of general literacy required to function in our information-based society, all students should have the opportunity to become computer literate;
- since computers affect all subject areas, computer literacy should not be considered the specialization of one subject or group of educators. Interdisciplinary content and examples from various subject fields should be incorporated into the program;

- to become computer literate, each student must have "hands-on" computer experience;
- computer literacy encompasses three dimensions: awareness, function and critical understanding. These dimensions should be introduced to students in a manner appropriate to their developmental and ability levels. Although all dimensions should be addressed at each level, the elementary school unit should place a strong emphasis on an overall awareness of computers in society, including their applications in everyday life. The junior high component should foster a functional or working knowledge of computers and their capabilities for problem-solving. At the senior high level, the program should stress critical understanding of the implications and effects of the use of computers in society and how computers can directly and indirectly affect the individual.

The dimensions of computer literacy to be emphasized at each of the three levels of schooling are depicted in the continuum below:



## Major Goals

The junior high computer literacy program is designed to contribute to the achievement of the goals for computer literacy in Alberta.

1. To develop student understanding of basic computer operations and terminology.
2. To develop an appreciation of the technological development of computer systems.
3. To develop student skills, attitudes and interests which facilitate the use of computer systems.
4. To have students appreciate that effective problem-solving with computer systems requires the application of logical thought processes and the development of the skills required for a holistic, systematic approach to problem-solving.
5. To have students appraise the applications, limitations and capabilities of computer systems.
6. To have students assess the current and potential impact of computer systems on society.
7. To develop student skills, attitudes and interests that will facilitate adaptation to changes in the workplace due to technological developments.
8. To promote a greater understanding and increase utilization of computer technology in other subject areas.

Students should be given the opportunity to explore as widely as possible, and be encouraged to pursue investigative activities based upon personal goals and interests.



## Core-Elective Format

The program of studies consists of mandatory core and elective components. The core component consists of skills, concepts, interests and attitudes to be studied by all students taking the junior high computer program. The core component shall comprise 80% of the instructional time.

The elective component provides an opportunity for teachers to choose from a variety of suggested topics in order to complete the requirements of the program. Approximately 20% of the instructional program shall be devoted to the elective component. It is intended that this portion be utilized as a means of meeting student needs and to explore areas of student interest. Further information regarding the elective is provided in the section entitled "Elective Component".

## Program Structure

The junior high computer literacy program is to be offered as a Group A - Option (minimum time allotment should be 75 hours). While the program may be offered at either the grade 7, 8 or 9 level it is recommended that maximum exposure of the program to the greatest number of students be a guiding principle in its implementation. Consecutive repetition of the program for the same group should be avoided. The course was designed with a grade 8 target group in mind and, as such, some of the concepts may be too abstract for the grade 7 student.



## Core Topics

The junior high computer literacy program is organized around the following five core areas. These topics extend the computer literacy experience offered at the elementary level and prepare students for programs offered at the senior high level. The core component permits sufficient flexibility to accommodate the needs of students with no previous background, and offers suggestions (see comments section of the core component schematic) for extending the background and skills of experienced students.

- Topic 1: Computer Systems
- Topic 2: Computer Operations
- Topic 3: Computer Programming
- Topic 4: Computer Applications
- Topic 5: The Societal Impact of Computers

## Provisions for Differences in Student Backgrounds

Provision for differences in student background, skill level in the use of computers, upon entry into the program, should be achieved through varying emphasis placed on core topics and the manner in which the elective is applied. For students with previous computer experience the following emphasis should be devoted to core topics:

<u>Core (80%):</u>	Topic 1:	5%
	Topic 2+3:	30%
	Topic 4:	30% (with emphasis on objective 4.5)
	Topic 5:	15%

Elective (20%): The elective could be used to broaden skill and experience with interactive data processing programs, or in demonstrated areas of student interest and ability.

For students with no previous computer experience the following emphasis should be placed on core topics:

<u>Core (80%):</u>	Topic 1:	5%
	Topic 2+3:	50%
	Topic 4:	15%
	Topic 5:	10%

Elective (20%): The elective should be used to strengthen operational/programming skills and background knowledge.

## Course Implementation

Successful implementation of the Computer Literacy 10 course is dependent upon the extent to which planning for implementation has taken place at the district and/or school levels. School administrators should consider provisions for teacher inservice, organization for instruction, facilities, availability of hardware and software, and differences in student background. It is highly recommended that the Alberta Education publication *Implementing Computer Literacy Programs in Schools* be consulted for information and guidelines concerning program implementation.

## Hardware and Software Requirements

To allow each student the opportunity to participate in hands-on computer experiences necessary to achieve the core components of the course, a minimum of one work station (one computer, one monitor, one floppy disk drive) per three students who have not had previous experience. If the class composition is such that the majority of students have had previous computer experiences, a higher ratio of students to work stations could be considered. It is important, in either case, that access to computers be carefully considered prior to a decision to offer the course. Students' previous background, class enrollment are critical to organization and success in meeting the goals established for the program. It is advisable that a minimum of one printer per class be used. However, the efficiency of achieving printing requirements would be greatly enhanced with additional printer units. Administrators are also advised to consult the Building Quality Restoration Program (BQRP) guidelines for business education in planning computer work stations.

Software\* to accompany the course should include one or more of the following programs:

- . data management program
- . word processing program
- . spreadsheet program
- . simulation packages
- . graphic processor
- . music processor
- . integrative software

\*Commercial software to supplement the course is under review by Alberta Education.

# Methodology

The development of functional knowledge through "hands-on" experiences with a computer should be the primary focus of the junior high computer literacy course. Some of the most effective learning about programming may occur when students experiment with existing programs and examine the consequences of modifying statements, or develop short computer programs to solve simple problems. Solutions to problems should be developed through the application of logical thought processes rather than through trial and error at the computer keyboard.

Junior high students should be introduced to a variety of applications that illustrate the computer as a problem-solving tool. Students should receive a variety of problems that allow them to reinforce the use of the elementary commands in BASIC (or another language) as they develop problem-solving techniques. Since the recommended amount of hardware is substantially less than the number of students, all students will not be engaged in the same activity at the same time. A portion of the work students will do at the computer may be done in small groups of two or three. This may reduce frustration among students who are experiencing difficulties working with the computer, develop interpersonal skills, and assist students in arriving at solutions to problems that might otherwise require teacher intervention. The group method is time and cost effective, and may contribute to a more positive attitude about computers and programming to solve problems.

Recognizing that only a portion of the class can be engaged in independent work at the computers at any one time, the rest of the students may participate in a variety of activities that contribute to the achievement of the objectives of the course. Suggested activities include small group work, overhead presentations, viewing of audiovisual materials, and research projects. This should minimize the frustration of students and prevent them from waiting impatiently for time at a computer. Instructional strategies and materials should accommodate individual differences and allow for students to learn at a rate with which they feel comfortable. Careful organization is essential if the classroom is to be adaptable to this variety of activities. The computer stations or laboratory should also be located so as to minimize distraction of students engaged in other activities.

Students should be introduced to structured programming techniques. These techniques incorporate a modular approach emphasizing top down programming. For information on this topic, Computer Literacy - A Hands-on Approach by Arthus Luehrmann (McGraw-Hill Ryerson) suggested.

It is highly recommended that all students develop proper keyboarding skills as early as possible in the computer literacy program in order to maximize use of available hardware.



# Learning Resources

The following resources\* have been approved for the course:

Prescribed: (Print)

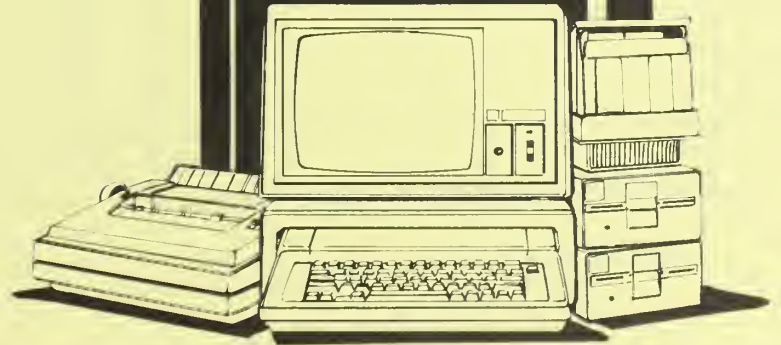
Noonan, Larry. The Age of Computer Literacy. Toronto:  
Oxford University Press, 1983, 332 pp.

Richman, Ellen. Spotlight on Computer Literacy. New York,  
New York: Random House, Inc., 1982, 186 pp. Canadian  
Distributor: Britannica Learning Materials.

Note: At the time of the printing of this guide, software programs were still under review by Alberta Education. Schools will be advised of software authorizations at a later date.



# PROGRAM OF STUDIES



# Core Components

## Topic 1: Computer Systems

- Goals:
1. To develop student understanding of basic computer operations and terminology.
  2. To develop an appreciation of the technological development of computer systems.

OBJECTIVES	DIMENSION STATUS	CONCEPTS/SKILLS/COMMENTS
The student will:		
1.0 DESCRIBE THE BASIC OPERATIONS AND HISTORY OF COMPUTER SYSTEMS.		
1.1 Recognize and use basic computer terms.	A	Review terminology from the elementary unit (e.g., names of computer peripherals, system commands, hardware, software, Central Processing Unit, chip, silicon wafer, microprocessor, computer program). Additional terms: algorithm, bug, binary number system, bit, byte, "K", names of secondary or auxiliary storage and primary storage devices, Random Access Memory, Read Only Memory, arithmetic unit, logic unit, integrated circuit, Very Large Scale Integration, Disk Operating System and BASIC commands from Topics 2 and 3 (not covered at the elementary level).
1.2 Briefly describe the historical development of computer systems.	AR	Emphasis should be placed upon the rapid changes in computer technology since the 1940's with projections for the future: mechanical, electromechanical, and electronic devices, and the role played by vacuum tubes, transistors, integrated circuits and Very Large Scale Integration (VLSI). Comment: Stress should be placed on the trends rather than the details of technological developments.
1.3 Describe a computer system.	A	There are various types of computers (micro, mini, mainframe). A computer system has certain basic operations including Input-Processing-Output. Each part of a computer system (CPU, arithmetic unit, logic unit, memory, input and output devices, computer program) has a role in these operations. There is a relationship between input and output (e.g., accuracy of data input determines output). Computers may have graphics and sound capabilities. Computers may be connected to each other to access and share information.

NOTE: Dimension Codes -- A = Awareness; F = Function; U = Critical Understanding.  
 Status Code -- R = Review (covered in Elementary course)  
 Hands-On Required -- \*

## Topic 2: Computer Operations

Goal: To develop student skills, attitudes and interests which facilitate the use of computer systems.

OBJECTIVES	DIMENSION STATUS	CONCEPTS/SKILLS/COMMENTS
The student will:		
2.0 USE A COMPUTER SYSTEM.		
2.1 Demonstrate responsible behavior in using a computer system.	F*	<p>There are rules/policies/procedures concerning:</p> <ul style="list-style-type: none"> <li>- care of hardware: storage, movement, operation</li> <li>- care of software: storage and handling of disks; back-up of programs</li> <li>- ethical use of a computer system: copyright violation; tampering with other users' materials; theft of software storage devices, programs, hardware</li> <li>- scheduling students' access to hardware/software</li> </ul>
2.2 Utilize system commands with prepared programs and available hardware.	FR*	<p>Skills to develop:</p> <ul style="list-style-type: none"> <li>- using system commands to run prepared programs</li> <li>- using proper procedure to sign-on or off a terminal or power up a micro/mini computer properly</li> <li>- manipulating the flow of information through the use of peripherals (e.g., cassette recorder, disk drive, printer)</li> <li>- understanding error messages</li> <li>- locating and using alphanumeric and special function keys on a computer keyboard</li> <li>- reading and comprehending documentation written at the students' level (e.g., teacher guide sheets, some computer manuals)</li> </ul>
2.3 Demonstrate knowledge of the Disk Operating System.	F	<p>Skills to develop:</p> <ul style="list-style-type: none"> <li>- explain the function of DOS</li> <li>- initialize a diskette</li> </ul>

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 Hands-On Required -- \*

Topic 3: Computer programming

Goal: To have students appreciate that effective problem-solving with computer systems requires the application of logical thought processes and development of the skills required for a holistic, systematic approach to problem-solving.

OBJECTIVES	DIMENSION STATUS	CONCEPTS/SKILLS/COMMENTS
The student will:		
3.0 FOLLOW AN ORDERLY SEQUENCE OF STEPS IN DEVELOPING A PROGRAM TO SOLVE A PARTICULAR PROBLEM.		
3.1 Recognize that BASIC is only one of the languages used on micros.	A	A computer will not function properly unless instructions are stated in the language of the particular computer. Alternate programming languages include LOGO, Integer BASIC, PILOT, PASCAL, FORTRAN and COMOL.
3.2 Outline a procedure (algorithm) to solve a problem.	F	Skills to develop: <ul style="list-style-type: none"> <li>- properly defining problems</li> <li>- recognizing flow chart symbols</li> <li>- reading and explaining a flow chart</li> <li>- drawing a flow chart to represent a solution to a problem</li> </ul>
3.3 Code a given procedure (algorithm) into a computer program.	F*	Skills to develop: <ul style="list-style-type: none"> <li>- providing an operational definition of 'computer program'</li> <li>- recognizing the difference between system commands and program statements</li> <li>- using NEW, SAVE, LIST, DELETE, LOCK, UNLOCK commands or their equivalent in another computer language</li> <li>- producing programs that include the following components of BASIC or their equivalent in another computer language: meaningful variable names; numeric and string variables; END, STOP, LET, PRINT, INPUT, tabulation statements; mathematical operators, application of rules determining order of evaluation of mathematical operators; relation symbols (&lt; &gt; =) conditional (IF/THEN) and unconditional (GOTO) branching; simple graphics; readable output through appropriate formatting; brief documentation (e.g., REM statements) and user-friendly techniques</li> <li>- uses structured programming techniques</li> </ul>
3.4 Be able to analyze computer programs.	F*	Skills to develop: <ul style="list-style-type: none"> <li>- testing and debugging personal programs and checking results for correctness</li> <li>- understanding programming error messages</li> <li>- analyzing simple programs, detecting logic and syntax errors, and determining the value of each variable to be output</li> <li>- use of a line editor to assist in debugging</li> </ul>
3.5 Display confidence in his/her ability to use and control computers.	F*	Each student should independently design and successfully demonstrate a computer program.

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Hands-On Required -- \*



Topic 4: Computer Applications

- Goal: 1. To have students appraise the applications, limitations and capabilities of computer systems.
2. To promote a greater understanding and increase utilization of computer technology in other subject areas.

OBJECTIVES	DIMENSION STATUS	CONCEPTS/SKILLS/COMMENTS
The student will:		Comment: This section should provide a <u>brief</u> overview of the concepts indicated.
4.0 DESCRIBE THE BASIC APPLICATIONS, LIMITATIONS, AND CAPABILITIES OF COMPUTERS.		
4.1 Identify specific tasks performed by computers in various areas of society.	AR	Examples of areas where computers are used: banking, manufacturing, transportation, government, recreation, publishing, creative arts, medicine, business, research, military, law enforcement, libraries, weather prediction, education, the home.
4.2 Describe computer capabilities and limitations.	A	Computers are best suited for tasks requiring speed, accuracy, repeated operations and processing of large amounts of data.
4.3 Identify tasks which are not suited to computer applications.	F*	Some problems require computer use while others do not: - use a computer and a calculator to perform similar mathematical tasks, including non-repetitive calculation, and compare efficiency of the two devices.
4.4 Describe why a computer can only do what people instruct it to do.	U	A computer needs a program to operate. Instructions must be exact. "Computer errors" are usually errors made by people. A computer is only an electronic device and cannot make independent decisions.
4.5 Manipulate information using a commercially prepared interactive data processing program.	F*	Each student should demonstrate the ability to use a word processor, data base management system or an electronic spreadsheet.

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 Hands-On Required -- \*

Topic 5: The Societal Impact of Computers

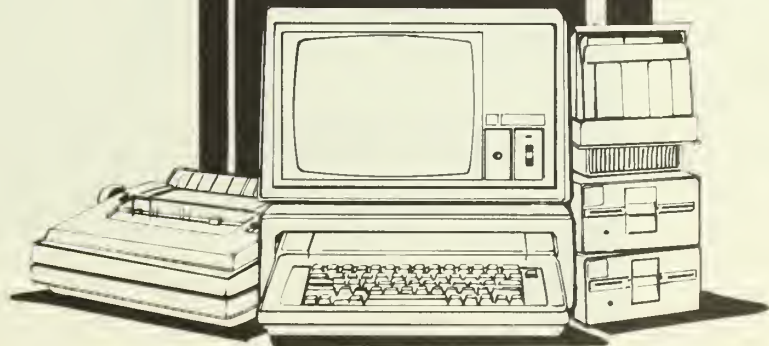
Goal: To have students assess the current and potential impact of computer systems on society.

OBJECTIVES	DIMENSION STATUS	CONCEPTS/SKILLS/COMMENTS
<p>The student will:</p> <p>5.0 APPRECIATE THE IMPACT THAT COMPUTERS CAN HAVE ON OUR LIFESTYLE.</p> <p>5.1 Describe ways in which computers can directly and indirectly affect his/her life.</p>	U	<p>The increasing use of computers in society has both advantages and disadvantages. For example, computers have an impact on:</p> <ul style="list-style-type: none"> <li>- employment and career opportunities</li> <li>- the education system</li> <li>- the economic structure</li> <li>- crime and crime detection</li> <li>- access to information</li> <li>- copyright laws</li> </ul>

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 Status Code -- R = Review (covered in Elementary course)  
 Hands-On Required -- \*



# ELECTIVE COMPONENT





## Notes Concerning the Elective

The elective component of the computer literacy program is a compulsory section of the course where students and teachers have some flexibility in determining what is to be studied and how it is to be studied. The topics covered should be related to the course in that they are based on overall objectives for the program.

Electives may be pursued utilizing several methods ranging from individual to group studies and from structured to open-ended investigations. Electives should be designed to make computer literacy interesting and meaningful through the assimilation of content and the study of contemporary computer related issues.

The elective component of the computer literacy program should be directed toward:

- i. developing background knowledge, and the operational and programming skills of students with no previous computer experience
- ii. extending and enriching particular skills and interests of students with computer experience either on an individual or group basis
- iii. extension of concepts and skills related to core topics

Suggested instructional strategies for achieving the above include the use of periodicals/journals, self-developed computer programs (data processing, games, simulations) individual research projects and tutoring of other students.



## Suggested Elective Topics

## Topic 1: Computer Systems

OBJECTIVE	DIMENSION
The student will:	
Identify processes which are analogous to a computer because they use input, processing and output.	A
Describe the advantages and limitations of the different types of computers (micro, mini, mainframe).	A
Describe how digital computers operate upon information which has been encoded in binary using the base 2 number system.	A
Discuss the work of inventors who contributed to the development of the computer.	A

## Topic 2: Computer Operations

OBJECTIVE	DIMENSION
<p>The student will:</p> <p>Recognize the existence of other disk operating systems and the compatibility between different systems.</p>	<p>A</p>

NOTE: Dimension Codes -- A = Awareness; F = Function;  
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Status Code -- R = Review (covered in Elementary course)  
Hands-On Required -- \*

Topic 3: Computer Programming

OBJECTIVE	DIMENSION
<p>The student will:</p> <p>Explain the existence of several variations of the BASIC language.</p> <p>Modify a program to accomplish a new but related task.</p> <p>Develop a computer program that includes GOSUB/RETURN, FOR/NEXT, GET, READ/DATA statements or their equivalent in another computer language.</p> <p>Incorporate error-checking routines in program.</p> <p>Use auxillary programs to assist in programming: e.g., line editor, renumber, bubble sort, rounding off routine, shape tables.</p> <p>Use other programming concepts, e.g., arrays - 1 and 2 dimensions, string handling, sound generation, animation.</p> <p>Examine an alternate computer language; e.g., LOGO, FORTH, COMOL.</p>	<p>A</p> <p>F*</p> <p>F*</p> <p>F*</p> <p>F*</p> <p>F*</p> <p>F*</p>

NOTE: Dimension Codes -- A = Awareness; F = Function;  
U = Critical Understanding.  
Status Code -- Review (covered in Elementary course)  
Hands-On Required -- \*

Topic 4: Computer Applications

OBJECTIVE	DIMENSIONS
<p>The student will:</p> <p>Use a word processing system in writing a composition.</p> <p>Retrieve selected information from a computer data base using a prepared data management program.</p> <p>Use an electronic spreadsheet.</p> <p>Describe the time-sharing system of a large complex computer and the process of being on-line (suggested field trip and/or accessing an information retrieval system).</p> <p>Use a computer simulation to demonstrate understanding of the effects/interaction/limitations of variables.</p> <p>Select, on the basis of program documentation and computer capabilities, a commercial program appropriate to the execution of a given task.</p>	<p>F*</p> <p>F*</p> <p>F*</p> <p>F*</p> <p>F*</p> <p>A*</p>

NOTE: Dimension Codes -- A = Awareness; F = Function;  
U = Critical Understanding.  
Status Code -- R = Review (covered in Elementary course)  
Hands-On Required -- \*

Topic 5: The Societal Impact of Computers

OBJECTIVE	DIMENSION
<p>The student will:</p> <p>Recognize that computerization can personalize and depersonalize social interaction.</p> <p>Predict how computers will affect our lives in the future.</p> <p>Identify careers directly involved with the computer and information processing industries.</p> <p>Describe some careers in which computer skills are desirable.</p> <p>Describe how computers are used to control other machines and devices (robotics).</p>	<p>U</p> <p>U</p> <p>A</p> <p>A</p> <p>U</p>

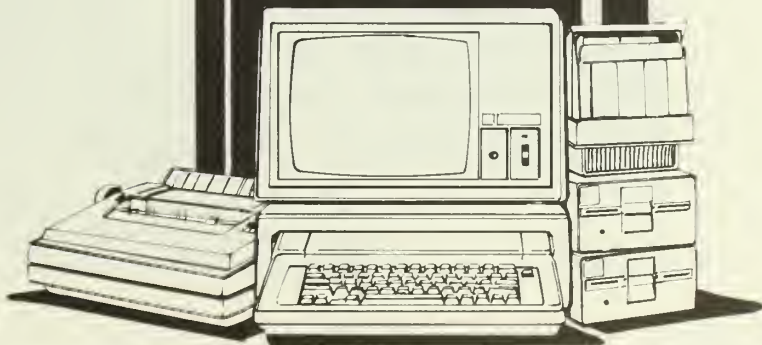
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# CLASSROOM INSTRUCTIONAL NOTES



## Evaluation

Since the program emphasizes a "hands-on" problem-solving approach to computer programming, the means of evaluation should not be limited to written tests. Evaluation emphasizing the problem-solving skills, attitudes and concepts specified should be continuous with maximum student participation. Strategies should include:

- a) evaluation of student computer programs
- b) written examinations and short quizzes
- c) student projects (e.g., history reports, scrapbook)
- d) observation of student performance on the computer
- e) student participation in classroom discussion

The final grade awarded to a student should reflect the proportion of time spent on each topic. The elective component should be included in the evaluation of student performance.

Computer programs developed by the student(s) should be considered as a means of determining computer understanding and proficiency. In addition, varying the level of mastery expected and the degree of difficulty for students with different ability levels should be considered in providing instruction and evaluation. Standards set for the evaluation of student performance should be established and communicated to students in advance. A sample checklist to evaluate student programs is provided on the following page.



# SAMPLE ONLY

## EVALUATION OF STUDENT-WRITTEN COMPUTER PROGRAMS

Name Mary Smith

Date Submitted \_\_\_\_\_

Total Mark \_\_\_\_\_ / \_\_\_\_\_

PROGRAM NAME	/5	/2	/1	/2	
Mary Smith 1					/10
Mary Smith 2					/10
Mary Smith 3					/10
Mary Smith 4					/10
Mary Smith 5					/10
Mary Smith 6					/10
Mary Smith 7					/10
Mary Smith 8					/10
Mary Smith 9					/10
Mary Smith 10					/10

/5 Does the program WORK and how EFFICIENT is it? Is the printout as specified?

/2 Flowchart? Problem statement? Other documentation?

/1 REM Statements for program identification, variables, commands?

/2 Is the program attractive to read? Title page? Additional features? User friendly?

## Provisions for the Gifted and Talented

The computer literacy program offers many opportunities for gifted and talented students to develop and extend their natural abilities through the use of computers. For this category of students the instructional program should be flexible and should permit the pursuit of individual interests and skills through differentiated instruction and the use of independent research projects and activities. The elective affords the teacher additional time to challenge students in this regard.

One of the major aims in the education of gifted students is to develop their research, deductive and creative thinking skills. One strategy for fostering these skills would be to provide opportunities for students to plan and carry out independent projects either inside or outside of the classroom or school. Regular instructing may have to be modified to compensate for these students.

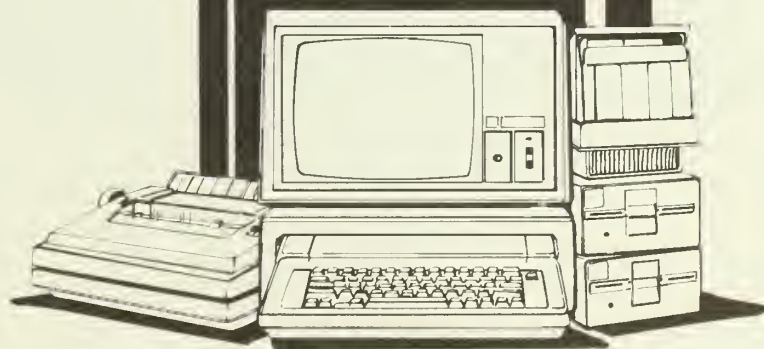
## Handicapped and Learning Disabled

Beyond uses for basic computer literacy training, microcomputer technology can be an effective tool for helping the physically handicapped and learning disabled. It has tremendous potential in providing for individualized instruction as well as providing better channels of communication between learner, teacher and others.

The major considerations in using this technology with handicapped or learning disabled student should be their particular needs and capabilities. Assessing these needs and capabilities generally requires the services of specialist personnel and/or support agencies to ensure that this technology provides appropriate personalized aid. After this is established, it may be possible to provide other modes of individualized instruction.

An overview of special considerations, needs, aids and courseware is found in Willson, John J. *Courseware in Special Education*, Alberta Education, Planning Services, 1983. Copies of this publication have been provided to Alberta school jurisdictions.

# APPENDIX







## Appendix

Additional information concerning learning resources and support materials:

Noonan, Larry. The Age of Computer Literacy. Toronto: Oxford University Press, 1983, 332 pp. Cost - ; Teacher's Guide -

The 13 chapters of this very current hardcover text provide coverage of the following areas: what computers are, how to use a computer, the history of computers, kinds of computers, computer hardware, computer software, computer systems, what goes on inside the computer, the languages of computers, programming, how computers work for us, computer problems and the future of computers. For each chapter, information is presented through narrative text and appropriate visuals, followed by a listing of key chapter terms and three or four student projects. The book contains an extensive glossary and an index. The author is Canadian and includes some Canadian computer applications such as Telidon and the computerized refinery processes used at Imperial Oil's Strathcona refinery.

Richman, Ellen. Spotlight on Computer Literacy. New York, New York: Random House, Inc., 1982, 186 pp. Canadian Distributor: Britannica Learning Materials.

The 24 short chapters in this softcovered text are divided into three units covering how computers work, how computers affect our lives, and programming a computer. Each chapter presents a brief overview of a topic, followed by exercises to reinforce new concepts. There is a glossary and an index. All examples of computer applications are American, but comparable Canadian examples could be easily substituted.

The teacher's guide provides an overview of the student text, a class progress chart and chapter-by-chapter teaching notes including chapter objectives, vocabulary, teaching ideas and additional explanations of concepts, a variety of activities and an answer key to the exercises and unit quizzes in the student text.







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